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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,666	06/21/2007	Johannes Baur	5367-243PUS	8470
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Cozen O'Connor 277 Park Avenue, 20th floor NEW YORK, NY 10172			EXAMINER HSIEH, HSIN YI	
			ART UNIT 2811	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/587,666

## Applicant(s)

BAUR ET AL.

## Examiner

HSIN-YI HSIEH

## Art Unit

2811

**Period for Reply**  
-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
  - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
  - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 19 May 2011.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1,3-7 and 9-23 is/are pending in the application.
- 4a) Of the above claim(s) 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3-7,9 and 11-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 May 2011 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-945)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 20110407,20110519
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 05/19/2011 has been entered.

### ***Information Disclosure Statement***

2. The information disclosure statement (IDS) submitted on 04/07/2011 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

3. The information disclosure statement filed 05/19/2011 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered. JP 2003510853 lacks a legible copy.

### ***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 2811

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. **Claims 1, 3, 4, 6, 11, 15, 22 and 23** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Nagahama et al. (US 2004/0004223 A1) in view of Heikman (US

2005/0077538 A1).

7. Regarding **claim 1**, Nagahama et al. teach a thin-film LED (light emitting device;

Abstract) comprising: an active layer (4; Fig. 1, paragraph [0072]), which (4) emits

electromagnetic radiation (intrinsic property of LED; paragraph [0072]) in a main radiation

direction (upward direction in Fig. 1 as implied in paragraph [0072]); a current expansion layer

(p-side cladding layer 5; ; Fig. 1, paragraph [0072]), which is disposed downstream of (above)

the active layer (4) in the main radiation direction (upward direction in Fig. 1) and is made of a

first nitride compound semiconductor material (first layer of  $\text{In}_x\text{Ga}_{1-x}\text{N}$  ( $0 \leq x \leq 1$ ); paragraph

[0074]); a main area (the top surface of 7; Fig. 1, paragraph [0072]), through which the

electromagnetic radiation (light) emitted in the main radiation direction (upward direction in Fig.

1) is coupled out (see Fig. 1, paragraph [0072]); and a first contact layer (p electrode 8; Fig. 1,

paragraph [0072]) arranged on the main area (the top surface of 7), wherein a transverse

conductivity of the current expansion layer (5) is increased by formation of a two-dimensional electron gas or hole gas (the hetero-junction of super lattice can form either a two-dimensional electron or hole gas under suitable biasing, and the increase in transverse conductivity is an intrinsic property of formation of the two-dimensional electron or hole gas), wherein at least one layer (second layer of 5; paragraph [0073]) made of a second nitride compound semiconductor material ( $\text{Al}_Y\text{Ga}_{1-Y}\text{N}$  ( $0 \leq Y \leq 1$ ); paragraph [0074]) having a larger electronic band gap than the first nitride compound semiconductor material (paragraph [0074]) is sandwiched in the current expansion layer (5; i.e. laminated in the order of 1<sup>st</sup> layer, 2<sup>nd</sup> layer, 1st layer and so on; see paragraph [0073]) to form the two-dimensional electron gas or hole gas (the hetero-junction of super lattice can form either a two-dimensional electron or hole gas under suitable biasing) in the current expansion layer (5), and wherein the at least one layer (second layer of 5) made of the second nitride compound semiconductor material ( $\text{Al}_Y\text{Ga}_{1-Y}\text{N}$  ( $0 \leq Y \leq 1$ )) has a doping (Mg doped; paragraph [0165]).

Nagahama et al. does not teach wherein the at least one layer made of the second nitride compound semiconductor material has a dopant concentration being higher in regions adjoining the current expansion layer than in a central region of the at least one layer made of the second nitride compound semiconductor material.

In the same field of endeavor of nitride semiconductor device, Heikman teaches the at least one layer (L1 of AlGa<sub>N</sub> layer having the interface I2; Figs. 1 and 4, paragraph [0022, 0029]) made of the second nitride compound semiconductor material (AlGa<sub>N</sub>; paragraph [0029]) has a dopant concentration being higher in regions (10 nm of graded region at interface I2, which is n doped to the density of the polarization charge; paragraph [0029]) adjoining the current

expansion layer (L2 of GaN layer having the interface I2; Figs. 1 and 4, paragraph [0022, 0029]) than in a central region (the region of L1 outside the 10 nm of graded region, which is undoped; Figs. 1 and 4, paragraph [0029]) of the at least one layer (L1) made of the second nitride compound semiconductor material (AlGa<sub>N</sub>).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to combine the inventions of Nagahama et al. and Heikman and use the doping concentration as taught by Heikman, because the sheet carrier density at interfaces are increased and the barrier for majority carrier transfer between channels is much reduced as taught by Heikman (paragraph [0030]).

8. Regarding **claim 3**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein a plurality of layers (second layers of 5; paragraph [0073]) made of the second nitride compound semiconductor material (Al<sub>Y</sub>Ga<sub>1-Y</sub>N (0≤Y≤1); paragraph [0074]) are embedded in the current expansion layer (5; i.e. laminated in the order of 1<sup>st</sup> layer, 2<sup>nd</sup> layer, 1<sup>st</sup> layer and so on; see paragraph [0073]).

9. Regarding **claim 4**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the at least one layer made of the second nitride compound semiconductor material (second layers of 5; paragraph [0073]) comprises a number of layers (second layers of 5; paragraph [0073]) made of the second nitride compound semiconductor material (Al<sub>Y</sub>Ga<sub>1-Y</sub>N (0≤Y≤1); paragraph [0074]), wherein the number of layers is between 1 and 5 inclusive (can be one in a supper lattice of two layers; paragraph [0073]).

10. Regarding **claim 6**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the first nitride compound semiconductor material is GaN ( $\text{In}_x\text{Ga}_{1-x}\text{N}$  ( $0 \leq x \leq 1$ ) with  $x=0$ ; paragraph [0074, 0131]).
11. Regarding **claim 11**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the active layer (4) includes  $\text{In}_x\text{Al}_y\text{Ga}_{1-x-y}\text{N}$  where  $0 \leq x \leq 1$ ,  $0 \leq y \leq 1$  and  $x+y \leq 1$  ( $\text{InGaN}$ , i.e.  $\text{In}_x\text{Al}_y\text{Ga}_{1-x-y}\text{N}$  with  $y=0$ ; paragraph [0072]).
12. Regarding **claim 15**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the first contact layer (p electrode 8) comprises no aluminum (p-electrode consisting of Ni and Au; paragraph [0372]).
13. Regarding **claim 22**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the current expansion layer (5) includes two partial layers (two first layers; paragraph [0072]) made of the first nitride compound semiconductor material (first layer of  $\text{In}_x\text{Ga}_{1-x}\text{N}$  ( $0 \leq x \leq 1$ )) separated from one another by the at least one layer made of the second nitride compound semiconductor material (second layers of ( $\text{Al}_y\text{Ga}_{1-y}\text{N}$  ( $0 \leq y \leq 1$ )), i.e. laminated in the order of 1st layer, 2nd layer, 1st layer and so on; paragraph [0073]).
14. Regarding **claim 23**, Nagahama et al. teach a thin-film LED (light emitting device; Abstract) comprising: an active layer (4; Fig. 1, paragraph [0072]), which (4) emits electromagnetic radiation (intrinsic property of LED; paragraph [0072]) in a main radiation direction (upward direction in Fig. 1 as implied in paragraph [0072]); a current expansion layer (p-side cladding layer 5; ; Fig. 1, paragraph [0072]), which is disposed downstream of (above) the active layer (4) in the main radiation direction (upward direction in Fig. 1) and is made of a first nitride compound semiconductor material (first layer of  $\text{In}_x\text{Ga}_{1-x}\text{N}$  ( $0 \leq x \leq 1$ ); paragraph

[0074]); a main area (the top surface of 7; Fig. 1, paragraph [0072]), through which the electromagnetic radiation (light) emitted in the main radiation direction (upward direction in Fig. 1) is coupled out (see Fig. 1, paragraph [0072]); and a first contact layer (p electrode 8; Fig. 1, paragraph [0072]) arranged on the main area (the top surface of 7), wherein a transverse conductivity of the current expansion layer (5) is increased by formation of a two-dimensional electron gas or hole gas (the hetero-junction of super lattice can form either a two-dimensional electron or hole gas under suitable biasing, and the increase in transverse conductivity is an intrinsic property of formation of the two-dimensional electron or hole gas), wherein at least one layer (second layer of 5; paragraph [0073]) made of a second nitride compound semiconductor material ( $\text{Al}_Y\text{Ga}_{1-Y}\text{N}$  ( $0 \leq Y \leq 1$ ); paragraph [0074]) having a larger electronic band gap than the first nitride compound semiconductor material (paragraph [0074]) is sandwiched in the current expansion layer (5; i.e. laminated in the order of 1<sup>st</sup> layer, 2<sup>nd</sup> layer, 1<sup>st</sup> layer and so on; see paragraph [0073]) to form the two-dimensional electron gas or hole gas (the hetero-junction of super lattice can form either a two-dimensional electron or hole gas under suitable biasing) in the current expansion layer (5), and wherein the at least one layer (second layer of 5) made of the second nitride compound semiconductor material ( $\text{Al}_Y\text{Ga}_{1-Y}\text{N}$  ( $0 \leq Y \leq 1$ )) has a doping (Mg doped; paragraph [0165]).

Nagahama et al. does not teach wherein the at least one layer made of the second nitride compound semiconductor material has a dopant concentration being higher in regions adjoining the current expansion layer than in a central region of the at least one layer made of the second nitride compound semiconductor material, and wherein the dopant concentration in the regions



adjoining the current expansion layer is higher than in a dopant concentration in the current expansion layer.

In the same field of endeavor of nitride semiconductor device, Heikman teaches the at least one layer (L1 of AlGaN layer having the interface I2; Figs. 1 and 4, paragraph [0022, 0029]) made of the second nitride compound semiconductor material (AlGaN; paragraph [0029]) has a dopant concentration being higher in regions (10 nm of graded region at interface I2, which is n doped to the density of the polarization charge; paragraph [0029]) adjoining the current expansion layer (L2 of GaN layer having the interface I2; Figs. 1 and 4, paragraph [0022, 0029]) than in a central region (the region of L1 outside the 10 nm of graded region, which is undoped; Figs. 1 and 4, paragraph [0029]) of the at least one layer (L1) made of the second nitride compound semiconductor material (AlGaN), and wherein the dopant concentration (the density of the polarization charge) in the regions (10 nm of graded region at interface I2) adjoining the current expansion layer (L2) is higher than in a dopant concentration in the current expansion layer (L2; L2 is undoped; paragraph [0029]).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to combine the inventions of Nagahama et al. and Heikman and use the doping concentration as taught by Heikman, because the sheet carrier density at interfaces are increased and the barrier for majority carrier transfer between channels is much reduced as taught by Heikman (paragraph [0030]).

15. **Claims 5, 7, 9, 12-14 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagahama et al. and Heikman as applied to claims 1 above.

16. Regarding **claim 5**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the at least one layer (second layer of 5; paragraph [0073]) made of the second nitride compound semiconductor material ( $\text{Al}_Y\text{Ga}_{1-Y}\text{N}$  ( $0 \leq Y \leq 1$ ); paragraph [0074]) has a thickness of a range of 1 nm to 10 nm (10 angstroms to 100 angstroms; paragraph [0076]) which overlaps claimed range of 10 nm to 100 nm, and establishes a prima facie case of obviousness (MPEP 2144.05).

17. Regarding **claim 7**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the second nitride compound semiconductor material is  $\text{Al}_x\text{Ga}_{1-x}\text{N}$  where  $0 \leq x \leq 1$  (paragraph [0074]) which overlaps the claimed range of  $0.1 \leq x \leq 0.2$ , and establishes a prima facie case of obviousness (MPEP 2144.05).

18. Regarding **claim 9**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein the first and second nitride compound semiconductor materials ( $\text{In}_X\text{Ga}_{1-X}\text{N}$  ( $0 \leq X \leq 1$ ) and  $\text{Al}_Y\text{Ga}_{1-Y}\text{N}$  ( $0 \leq Y \leq 1$ )) are p-doped (paragraph [0073]).

Nagahama et al. do not teach the first and second nitride compound semiconductor materials are n-doped.

It would have been an obvious matter of design choice to have the first and second nitride compound semiconductor materials n-doped, since the device can perform equally well with all the doping changing their polarity, which is well known in the field of semiconductor manufacturing.

19. Regarding **claim 12**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein at least one edge length (horizontal length in Fig. 1) of the main area (the top surface of 7).

Nagahama et al. do not teach wherein at least one edge length of the main area is 400  $\mu\text{m}$  or more.

Parameters such as the one edge length of the main area in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired device performance such as the total output power during device fabrication. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the one edge length of the main area within the range as claimed in order to achieve desired total output power.

20. Regarding **claim 13**, Nagahama et al. also teach the thin-film LED as claimed in claim 12, wherein at least one edge length (horizontal length in Fig. 1) of the main area (the top surface of 7).

Nagahama et al. do not teach wherein at least one edge length of the main area is 800  $\mu\text{m}$  or more.

Parameters such as the one edge length of the main area in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired device performance such as the total output power during device fabrication. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the one edge length of the main area within the range as claimed in order to achieve desired total output power.

21. Regarding **claim 14**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, the thin-film LED (Fig. 1).

Nagahama et al. do not teach wherein operation of the thin-film LED with a current intensity of 300 mA or more is provided.

This limitation is considered as “intended use”. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex Parte Masham*, 2 USPQ F.2d 1647 (1987).

22. Regarding **claim 16**, Nagahama et al. also teach the thin-film LED as claimed in claim 1, wherein a portion of the total area of the main area (the top surface of 7) is covered by the first contact layer (8).

Nagahama et al. do not teach wherein less than 15% of the total area of the main area is covered by the first contact layer.

Parameters such as the percentage of the total area of the main area covered by the first contact layer in the art of semiconductor manufacturing process are subject to routine experimentation and optimization to achieve the desired device performance during device fabrication. Therefore, it would have been obvious to one of the ordinary skill in the art at the time the invention was made to incorporate the percentage of the total area of the main area covered by the first contact layer within the range as claimed in order to achieve desired device performance.

23. **Claims 17-20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagahama et al. and Heikman as applied to claim 1 above, and further in view of Nozaki et al. (US 5,744,828 A).

Nagahama et al. teach, regarding to **claim 17**, wherein the first contact layer (8) has a lateral structure (see Fig. 1) comprising a contact area (the interfacial area between 7 and 8; see Fig. 1), and regarding to **claim 18**, the contact area (the interfacial area between 7 and 8; see Fig. 1).

Nagahama et al. and Heikman do not teach, regarding to **claim 17**, wherein the first contact layer has a lateral structure comprising a plurality of contact webs, regarding to **claim 18**, wherein the contact area is surrounded by at least one frame-type contact web, the frame-type contact web being connected to the contact area by means of at least one further contact web, regarding to **claim 19**, wherein the frame-type contact web has a square, rectangular or circular form, and regarding to **claim 20**, wherein the number of frame-type contact webs is one, two or three.

In the same field of endeavor of LED, Nozaki et al. teach, regarding to **claim 17**, wherein the first contact layer (excitation electrode 20; Fig. 1, col. 3 line 58) has a lateral structure (see Fig. 1) comprising a plurality of contact webs (current supply electrode 22; Fig. 1, col. 3 lines 60-61), regarding to **claim 18**, wherein the contact area (bonding pad 21; Fig. 1, col. 3 line 60) is surrounded by at least one frame-type contact web (current supply electrode 22; Fig. 1, col. 3 lines 60-61), the frame-type contact web (22) being connected to the contact area (21) by means of at least one further contact web (straight lines 22a; Fig. 1, col. 4 line 14), regarding to **claim 19**, wherein the frame-type contact web (22) has a square, rectangular or circular form (square form; see Fig. 1), and regarding to **claim 20**, wherein the number of frame-type contact webs (22) is one, two or three (three; see Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to combine the inventions of Nagahama et al., Heikman, and Nozaki et al. and use the frame-type contact web as taught by Nozaki et al., because the frame-type contact web lets the device uniformly emit light, to thereby improve the light emission efficiency of the device as taught by Nozaki et al. (col. 5 lines 12-16).

24. **Claim 21** is rejected under 35 U.S.C. 103(a) as being unpatentable over Nagahama et al. and Heikman as applied to claim 1 above, and further in view of Schubert (US 2003/0111667 A1).

25. Regarding **claim 21**, Nagahama et al. also teach the first contact layer (8).

Nagahama et al. and Heikman do not teach wherein a second contact layer, which reflects the electromagnetic radiation emitted by the active layer, is provided on a side of the active layer opposite to the first contact layer, the first contact layer having a contact area and the second contact layer having a cutout in a region opposite the contact area.

In the same field of endeavor of LED, Schubert teaches wherein a second contact layer (ohmic contacts 182 and reflective film 184; Fig. 8, paragraph [0029]), which reflects the electromagnetic radiation (paragraph [0029]) emitted by the active layer (emitting region 124; Fig. 8, paragraph [0024]), is provided on a side (bottom side) of the active layer (active region 120; Fig. 8, paragraph [0024]) opposite to the first contact layer (top contact 109; Fig. 8, paragraph [0024]), the first contact layer (109) having a contact area (the contact area between 109 and 160) and the second contact layer (182 and 184) having a cutout (central portion 185) in a region (185) opposite the contact area (the contact area between 109 and 160; see Fig. 8).

It would have been obvious to one of ordinary skill in the art at the time of invention was made to combine the inventions of Nagahama et al., Heikman, and Schubert and use the ohmic contacts as taught by Schubert, because the ohmic contacts increase the portion of the light that reaches and is reflected by the underling reflective film and also increase the light extraction efficiency as taught by Schubert (paragraph [0029]).

### ***Response to Arguments***

26. Applicant's amendments, filed 05/19/2011, overcome the objections to the drawings and claims 1, 3-9, and 11-12, and the rejections to claims 1, 3-9, and 11-12 under 35 U.S.C. 112. The objections to the drawings and claims 1, 3-9, and 11-12, and the rejections to claims 1, 3-9, and 11-12 under 35 U.S.C. 112 have been withdrawn.

27. Applicant's arguments with respect to claims 1 and 23 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HSIN-YI HSIEH whose telephone number is (571)270-3043. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne A. Gurley can be reached on 571-272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/LYNNE GURLEY/  
Supervisory Patent Examiner, Art Unit  
2811

/H. H./  
Examiner, Art Unit 2811  
7/17/2011